

“Application of High-Accuracy Reference Measurement Procedures for Target-Setting in WADA EQAS Programs for Longitudinal Steroid Profiling”

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Project overview:

The aim of this project is to utilise high-accuracy Reference Measurement Procedures (RMPs) developed at the National Measurement Institute of Australia (NMIA) to assign reference values with low measurement uncertainties for eight target analytes in World Anti-Doping Agency (WADA) External Quality Assessment Scheme (EQAS) samples. The target analytes are androsterone (A), etiocholanolone (E), testosterone (T), epitestosterone (epi-T), 5 α -androstane-3 α ,17 β -diol (5 α -Adiol) and 5 β -androstane-3 α ,17 β -diol (5 β -Adiol), 19-norandrosterone (19-NA) and the T/Epi-T ratio. Target setting using reference values in the WADA EQAS will enhance the value of the program permitting an objective evaluation of the performance of WADA-accredited laboratories. Accuracy-based grading provides a more robust and transparent indication of competency than consensus-group grading.

Results and Conclusions:

Reference values for the mass fractions and mass concentrations of testosterone (T), epitestosterone (EpiT), 5 α -androstane-3 α ,17 β -diol (5 α -Adiol), 5 β -androstane-3 α ,17 β -diol (5 β -Adiol), androsterone, etiocholanolone, and 19-norandrosterone (19-NA) and the T/EpiT ratio in human urine samples were determined for Cycle 3 of the 2016 World Anti-Doping Agency External Quality Assurance Scheme (WADA EQAS) for Longitudinal Steroid Profiling. Reference values were determined using a Reference Measurement Procedure (RMP) based on the technique of isotope dilution with gas chromatography tandem mass spectrometry (GC-MS/MS) analysis. The reference values are metrologically traceable to the SI units for mass (kg) and volume (m³) within their stated uncertainties. The measurement uncertainties were determined at a level of confidence of 95%.